Decision Document

Solid Waste Management Unit B-23
Building 103-30 Production Area
Hawthorne Army Depot
Hawthorne, Nevada

October 2001

Hawthorne Army
Depot

Decision Document SWMU B-23

October 2001

The selected remedy is protective of human health and the environment. It has been shown that a complete pathway to human health and the environment does not exist, and there is no potential for an exposure pathway to be completed in the future.

U.S. Army

19 NOV 2001

Anne L. Davis
Lieutenant Colonel, U.S. Army
Commanding

State of Nevada

30 Nov 2001

Paul Liebendorfer
Chief, Bureau of Federal Facilities

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Hawthorne, Nevada

1.0 Introduction

This decision document describes the rationale for the proposed closure of SWMU B-23, building 103-30 Production Area, at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. The US Army Corps of Engineers, Sacramento District, prepared this document with the help of HWAD for the Nevada Division of Environmental Protection (NDEP).

Tetra Tech, Inc. (Tt), was tasked by the US Army Corps of Engineers, Sacramento District (USACE), to perform remedial investigations and groundwater monitoring at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. These tasks were conducted from 1993 through 1997, primarily at solid waste management units (SWMUs) designated by the Army and the Nevada Division of Environmental Protection (NDEP). The NDEP is the lead regulatory agency for environmental issues at HWAD. The purpose of the sampling w as to determine the extent and degree of environmental impacts, if any, associated with activities performed at each SWMU. The primary goal of the investigation was to assess the environmental impacts and to report the findings, present conclusions, and recommend any remediation, if necessary.

With guidance from the NDEP, basewide proposed closure goals (PCGs) for soil were established as acceptable levels so that SWMU closure could be recommended and to assist in directing the investigative efforts toward those SWMUs where the target analytes were of greatest concern (Appendix A). These PCGs were used as action levels throughout this investigation and are used for comparison with the detected analytes in this report.

2.0 Site History

SWMU B-23 is in the HWAD's Building 103 Group (Figure 1-1) and is an inactive unlined catchment pit located 174 feet south of Building 103-30 (Figure 1-2). The catchment pit measures 65 feet long by 15 feet wide and is up to 4 feet deep. The catchment pit has been eroded and partially filled with windblown sand.

The USACE, HWAD and the NDEP agreed to define boundaries of each SWMU using annotated monuments and survey pins. As part of Ecology and Environment, Inc's., (E&E) 1997 field investigations, a survey monument was constructed and surveyed at SWMU B-23. A brass survey pin on the monument designates the monument number HWAAP-96-1996 and the SWMU number B-23. Three corner pins were set and surveyed to define the SWMU boundary, with the monument at the northwest corner. The locations of these corner markers and the SWMU boundary are shown on Figure 1-2. The survey data for this SWMU are presented in Appendix B.

3.0 Site Conditions

The catchment pit at SWMU B-23 reportedly was in operation from 1940 to the early 1960s and received moderate amounts of reactive hazardous wastewater containing TNT and cyclotrimethlyenetrinitramine (RDX) from water-cooled ordnance cutting saws. The munitions handled at building 103-30 also contained metal components, which could have become part of the waste stream.

During E&E's 1994 investigation and Tt's 1997 through 2001 groundwater monitoring, the depth to groundwater was measured at approximately 117 feet below ground surface (bgs) at groundwater monitoring wells IRPMW40 and IRPMW41.

Based on the past uses of the catchment pit at SWMU B-23, and on the observations made during the previous site inspections, the target analytes at this SWMU were known to be explosives and metals.

4.0 Investigations

Soils encountered during E&E's investigation of SWMU B-23 were composed mostly of silty sands with some fine gravel; finer sandy silts were encountered at shallow depths. In 1994, sampling activities proposed by E&E for the remedial investigation at SWMU B-23 included collecting and analyzing both surface and subsurface soil samples. One surface soil sample and one near-surface soil sample were collected from both sample locations HA01 and HA02 at SWMU B-23. The subsurface investigation at SWMU B-23 consisted of one cone penetrometer test (CPT) sounding with an adjacent sample boring, CPS01, drilled on the north side of the catchment pit, as shown on Figure 3-1. The sounding was advanced to a total depth of 111 feet bgs with no indication of groundwater. The CPT soil sample location was selected from the top 18 inches of a fine-grained horizon at a depth of 10 feet bgs based on the interpretation of the CPT sounding log.

5.0 Investigation Results

Arsenic (2.9 mg/kg to 4.3 mg/kg), barium (57 mg/kg to 86 mg/kg), total chromium (3.5 mg/kg to 6.7 mg/kg), and lead (3.0 mg/kg to 24 mg/kg) were detected in all the surface and near-surface soil samples collected at locations HA01 and HA02. Mercury was detected only in the surface soil sample collected from location HA01 at a concentration of 0.18 mg/kg. No other metals were detected in these surface and near-surface samples.

Arsenic at 2.3 mg/kg, barium at 130 mg/kg, total chromium at 6.7 mg/kg, and lead at 13 mg/kg were detected in the subsurface soil sample collected at location CPS01. No other metals were detected in this subsurface sample.

The laboratory results of all four surface and near-surface soil samples collected from this catchment pit detected TNT (0.54 mg/kg to 150,000 mg/kg), octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) (0.93 mg/kg to 4,000 mg/kg), and RDX (4.3 mg/kg to 33,000 mg/kg). 1,3,5-trinitrobenzene (TNB) was detected in both the surface and five-foot sample collected from

HA01 and the five-foot sample collected from sample location HA02 at concentrations ranging from 1.4 mg/kg to 13 mg/kg. 2,4-Dinitrotoluene (DNT) and picric acid were detected only in the surface sample collected from sample location HA01 at concentrations of 12 mg/kg and 1.5 mg/kg, respectively. No explosives were detected in the subsurface soil sample collected from location CPS01. Appendix C has the analytical results of these investigations and figure 3-1 shows the locations of the samples.

At SWMU B-23, the detected metals arsenic, barium, total chromium, lead, and mercury, which are common in the Walker Lake Valley soils, are evaluated to be at naturally occurring concentrations near their background levels. All of these metals were reported at concentrations that did not exceed their PCGs.

The soil at SWMU B-23 has been impacted with explosives and requires a remediation action. The extent of the contamination was within the pit area and about 5 feet deep, based on the limited depths of soil contamination, it is not likely that groundwater has been impacted by explosives from this site.

6.0 Remediation

It was determined that this SWMU would be excavated and resampled. The excavated soil would be treated as part of the base-composting program.

7.0 Remediation Results

SWMU B-23 had 105 cubic yards of material excavated and placed in the composting windrow 5D. The analytical results from the sample and the samples from window 5D are shown in Appendix D, the location of the confirmation samples are shown in figure 4. The confirmation samples were less than HWAD PCGs for all compounds.

8.0 Public Involvement

It is the US Department of Defense and Army policy to involve the local community throughout the investigation process at an installation. To initiate this involvement, HWAD has established and maintains a repository library at the local public library. This repository includes final copies of all past studies and other documents regarding environmental issues at HWAD. As future environmental documents are made available to HWAD the repository shall be updated.

HWAD has solicited community participation in establishment of a restoration and advisory board (RAB). To date there has been insufficient response and HWAD has not formed a RAB. HWAD has held open houses to inform the public of on going environmental issues. HWAD shall continue to solicit community involvement, and will establish a RAB should sufficient community interest be obtained.

9.0 Conclusions

The contaminated soil has been removed from SWMU B-23 and has been treated in the composting windrows to levels below clean up goals. SWMU B-23 should be returned to the base site master plan with the restriction of no construction within the SWMU area.

will

10.0 REFERENCES

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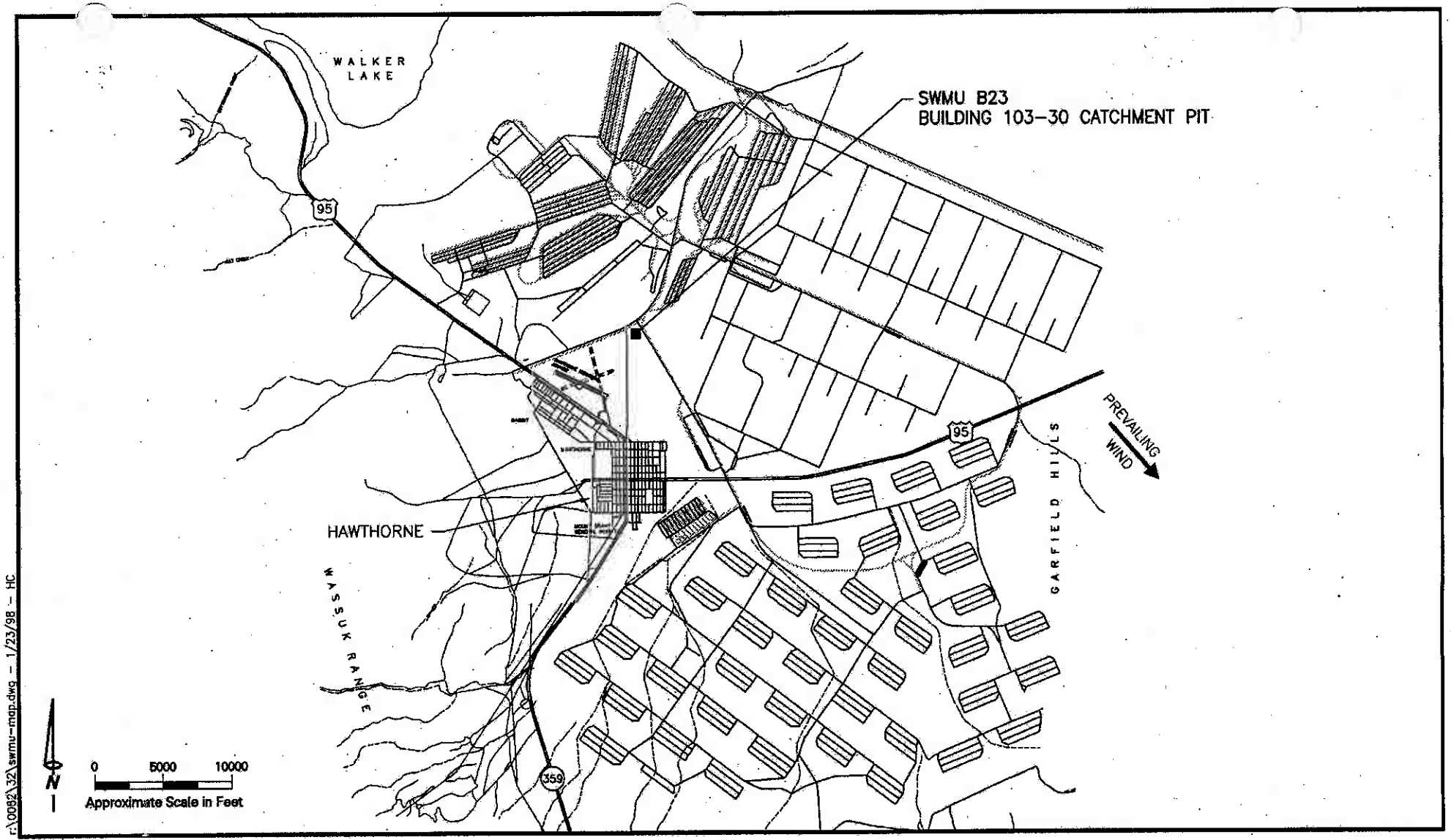


r:\0082\32\swmu-map.dwg - 1/23/98 - HC

SOURCE: TETRA TECH FINAL DATA PACKAGE, 1996 (REV. 1997)

Site Location Map
SWMU B23
Building 103-30 Catchment Pit

Hawthorne Army Depot
Hawthorne, Nevada

Figure 1-1

Tetra Tech, Inc.

Workspace: HWAD.WOR

Legend:

- Boundary Corner Pin
- Explosion Barrier
- Fence
- Railroad
- SWMU Monument

N

0 35 70

Approximate Scale in Feet

Site Map
SWMU B23
Building 103-30 Catchment Pit

Hawthorne Army Depot
Hawthorne, Nevada

Figure 1-2

Tetra Tech, Inc.

Workspace: nWAD.WOR

Legend:

- Boundary Corner Pin
- Hand Auger Location
- Soil Boring Location
- Railroad
- SWMU Monument

N

0 35 70

Approximate Scale in Feet

Tetra Tech, Inc.

Investigation Activity Map
SWMU B23
Building 103-30 Catchment Pit
Hawthorne Army Depot
Hawthorne, Nevada
Figure 3-1

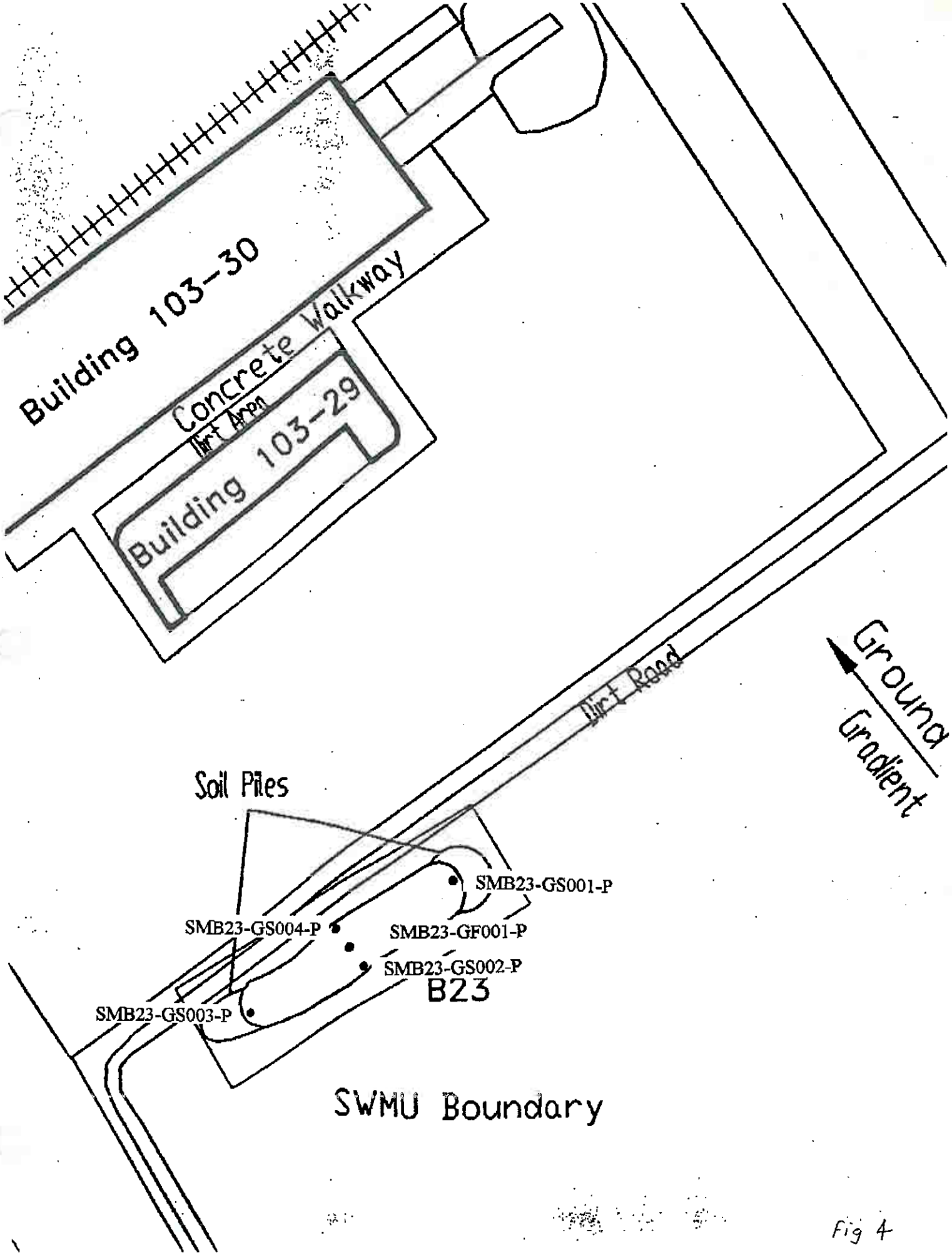

Building 103-30
Concrete Walkway
Dirt Area
Building 103-29
Dirt Road
Ground Gradient
Soil Piles
SMB23-GS001-P
SMB23-GS004-P
SMB23-GF001-P
SMB23-GS002-P
B23
SMB23-GS003-P
SWMU Boundary

Fig 4

Appendix A

Proposed Closure Goals
Hawthorne Army Depot
Hawthorne, Nevada

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Nitrate	Anion	NC	128,000	Calculated Subpart S[a]
2-Amino-dinitrotoluene	Explosive	NC	-	NA[b]
4-Amino-dinitrotoluene	Explosive	NC	-	NA
1,3-Dinitrobenzene	Explosive	NC	8	Calculated Subpart S
2,4-Dinitrotoluene	Explosive	NC	160	Calculated Subpart S
2,6-Dinitrotoluene	Explosive	NC	80	Calculated Subpart S
HMX	Explosive	NC	4,000	Calculated Subpart S
Nitrobenzene	Explosive	NC	40	Calculated Subpart S
Nitrotoluene (2-, 3-, 4-)	Explosive	NC	800	Calculated Subpart S
RDX	Explosive	NC	64	Calculated Subpart S
Tetryl	Explosive	NC	800	Calculated Subpart S
1,3,5-Trinitrobenzene	Explosive	NC	4	Calculated Subpart S
2,4,6-Trinitrotoluene	Explosive	C	233	Calculated Subpart S
Aluminum	Metal	NC	80,000	Calculated Subpart S
Arsenic (cancer endpoint)	Metal	C & NC	30	Background[c]
Barium and compounds	Metal	NC	5,600	Calculated Subpart S
Beryllium and compounds	Metal	C	1	Background
Cadmium and compounds	Metal	NC	40	Calculated Subpart S
Chromium III and compounds	Metal	NC	80,000	Calculated Subpart S
Lead	Metal	NC	1000	PRG[d]
Mercury and compounds (inorganic)	Metal	NC	24	Calculated Subpart S
Selenium	Metal	NC	400	Calculated Subpart S
Silver and compounds	Metal	NC	400	Calculated Subpart S
Acenaphthene	PAH	NC	4,800	Calculated Subpart S
Benzo[a]anthracene	PAH	C	0.96	Calculated Subpart S
Benzo[a]pyrene	PAH	C	0.10	Detection Limit[e]
Benzo[b]fluoranthene	PAH	C	0.96	Calculated Subpart S
Benzo[k]fluoranthene	PAH	C	10	Calculated Subpart S
Chrysene	PAH	C	96	Calculated Subpart S
Dibenz[ah]anthracene	PAH	C	0.96	Calculated Subpart S
Fluoranthene	PAH	NC	3,200	Calculated Subpart S
Fluorene	PAH	NC	3,200	Calculated Subpart S
Indeno[1,2,3-cd]pyrene	PAH	C	-	NA
Naphthalene	PAH	NC	3,200	Calculated Subpart S
Pyrene	PAH	NC	2,400	Calculated Subpart S
Total Petroleum Hydrocarbons as Diesel (TPH-d)	PAH	C	100	NDEP Level Clean-up[f]
Polychlorinated biphenyls (PCBs)	PCBs	C	25	TSCA[g]
Bis(2-ethylhexyl)phthalate (DEHP)	SVOC	C	1,600	Calculated Subpart S
Bromoform (tribromomethane)	SVOC	C	89	Calculated Subpart S

Proposed Closure Goals
Hawthorne Army Depot
Hawthorne, Nevada

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Butyl benzyl phthalate	SVOC	NC	16,000	Calculated Subpart S
Dibromochloromethane	SVOC	C	83	Calculated Subpart S
Dibutyl-phthalate	SVOC	NC	8,000	Calculated Subpart S
Diethyl phthalate	SVOC	NC	64,000	Calculated Subpart S
Phenanthrene	SVOC		-	NA
Phenol	SVOC	NC	48,000	Calculated Subpart S
Acetone	VOC	NC	800	Calculated Subpart S
Anthracene	VOC	NC	24,000	Calculated Subpart S
Benzene	VOC	C	24	Calculated Subpart S
Bis(2-chloroisopropyl)ether	VOC	C	3,200	Calculated Subpart S
Bromomethane	VOC	NC	112	Calculated Subpart S
Carbon tetrachloride	VOC	C	5	Calculated Subpart S
Chlorobenzene	VOC	NC	1,600	Calculated Subpart S
Chloroform	VOC	C	115	Calculated Subpart S
Chloromethane	VOC	C	538	Calculated Subpart S
Dibromomethane	VOC	C	0.008	Calculated Subpart S
1,2-Dichlorobenzene	VOC	NC	7,200	Calculated Subpart S
1,4-Dichlorobenzene	VOC	C	18,300	Calculated Subpart S
Dichlorodifluoromethane	VOC	C	16,000	Calculated Subpart S
Ethylbenzene	VOC	NC	8,000	Calculated Subpart S
Methylene bromide	VOC	NC	800	Calculated Subpart S
Methylene chloride	VOC	C	4,800	Calculated Subpart S
2-Methylnaphthalene	VOC		-	NA
1,1,2,2-Tetrachloroethane	VOC	C	35	Calculated Subpart S
Tetrachloroethylene (PCE)	VOC	C & NC	800	Calculated Subpart S
Toluene	VOC	NC	16,000	Calculated Subpart S
1,1,1-Trichloroethane	VOC	NC	7,200	Calculated Subpart S
Trichloroethylene (TCE)	VOC	C & NC	480	Calculated Subpart S
Trichlorofluoromethane	VOC	NC	24,000	Calculated Subpart S
1,2,3-Trichloropropane	VOC	C	480	Calculated Subpart S
Vinyl chloride	VOC	C	0.37	Calculated Subpart S
Xylene Total (m-, o-, p-)	VOC	NC	160,000	Calculated Subpart S
2,3,7,8-TCDD	Dioxin	C	0.000005	Calculated Subpart S

[a] RCRA 55 FR 30870

[b] Not available

[c] Highest background concentration detected in 50 background soil samples

[d] Smucker, Stanford J. USEPA Rgion IX, Preliminary Remedial Goals, Second Half, Sep. 1995

[e] Method detection limit for Volatile Organic Compounds by EPA Method 8260 or

Semi-Volatile Organic Compounds analyzed by EPA Method 8270

[f] Nevada Division of Environmental Protection

[g] Cleanup level for PCB spills in accordance with Toxic Substance and Control Act Spill Policy Guidelines 40 CFR 761

Clean-up Goals by Screening* and Definitive Analysis

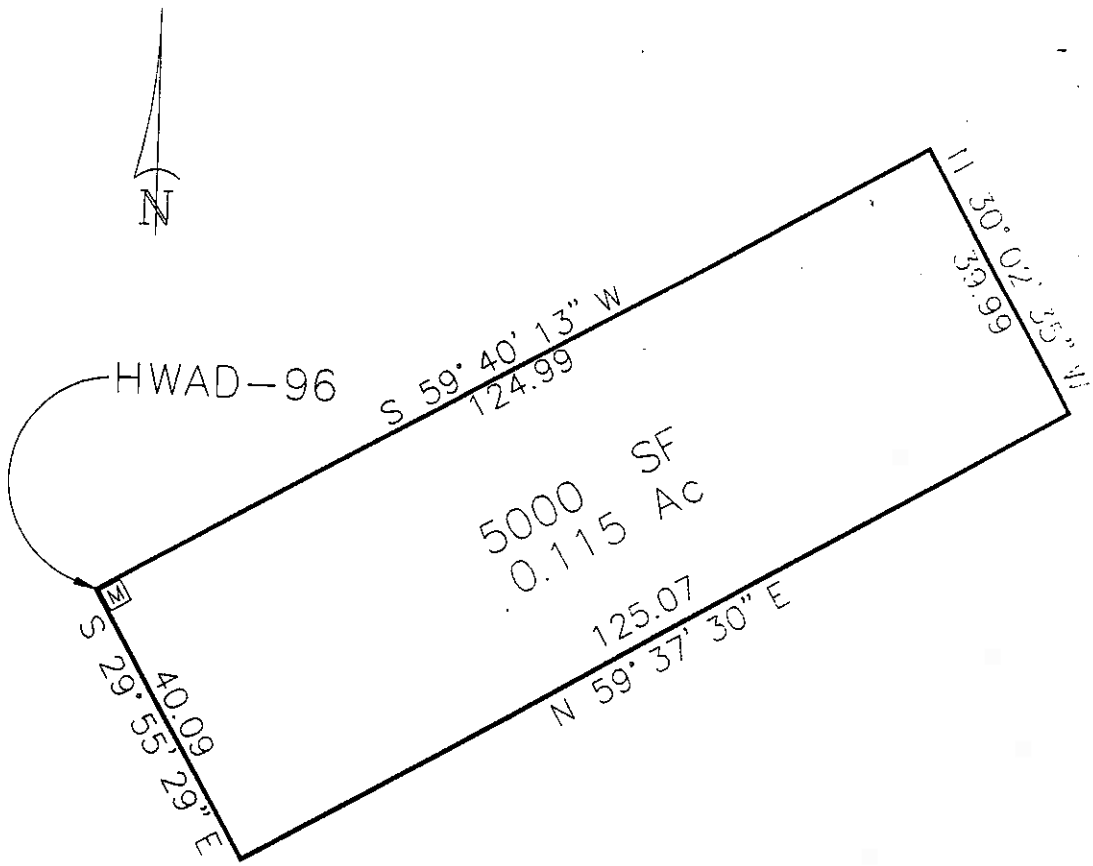
Contaminant	Concentration (mg/kg)
2,4,6,-trinitrotoluene (TNT)	40*
2,4-dinitrotoluene (2,4-DNT)	2.6
2,6-dinitrotoluene (2,6-DNT)	2.6
1,3,5-trinitrobenzene (1,3,5-TNB)	4
1,3,-drinitrobenzne (1,3-DNB)	8
2-amino-4,6dinitrotoluene (2-Am-DNT)	NE
4-amino-2,6-dinitrotoluene (4-Am-DNT)	NE
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	100
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	64
Picric acid	7
Pentachlorophenol	None

NE - not established

Proposed Excavation Goal (PEG's) by Definitive and Screening * Analysis-
Maximum Concentration of Contaminants
In Soil to Be Left in Place at Depth Below the Surface

Contaminant	Concentration (mg/kg)
2,4,6,-trinitrotoluene (TNT)	800*
2,4-dinitrotoluene (2,4-DNT)	80
2,6-dinitrotoluene (2,6-DNT)	80
1,3,5-trinitrobenzene (1,3,5-TNB)	150
1,3,-drinitrobenzne (1,3-DNB)	NE
2-amino-4,6dinitrotoluene (2-Am-DNT)	NE
4-amino-2,6-dinitrotoluene (4-Am-DNT)	NE
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	4000
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	300
Picric acid	7.0
Pentachlorophenol	NE
Nitroaromatics/Nitroamines	<30

Appendix B



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NE COR	N	14508308.687	E	2613900.788	ELEV 4160.979
SE COR	N	14508274.073	E	2613920.807	ELEV 4161.705
SW COR	N	14508210.829	E	2613812.902	ELEV 4161.842

PROFESSIONAL LAND SURVEYOR STATE OF NEVADA
RICHARD A. STINCHFIELD
7/21/97
No. 3631

20 10 0 20 40 60
SCALE IN FEET

ecology and environment, inc.
International Specialists in the Environment
SHEET 27 OF 28

SWMU B-23

COMSTOCK
LAND SURVEYING
777 LA RUE AVENUE, SUITE A
RENO, NEVADA 89509
PH. (702) 329-2072

SWMU B23 Survey Data
Hawthorne Army Depot
Hawthorne, Nevada

SWMU	Point ID	Northing (feet)	Easting (feet)	Elevation
B23	HA01	1384947.22	489479.19	4156.29
B23	HA02	1384922.31	489441.94	4156.43
B23	CPS01	1384936.44	489428.82	4160.33
B23	HWAAP-96-1996	1384920.34	489389.61	4161.41
B23	Pin 1	1384983.46	489497.49	4160.98
B23	Pin 2	1384948.85	489517.51	4161.71
B23	Pin 3	1384885.60	489409.61	4161.84

Notes:

NE = Not established

Coordinate data based on electronic map file using the NAD 1927 datum.

Elevation data based on surveyors map using NGVD 1929 datum.

Appendix C

Nitrogen
Method 353.2 (ASC)

Sample ID	Location ID	Sample Date	Depth	Nitrogen Nitrate
				mg/kg
B23-CPS1-1-010	CPS01	5/18/94	10	<1.1

Analyses	1
Detections	0
Minimum Concentration	0
Maximum Concentration	0
HWAD - PCG	128000
HWAD - PCG Hits	0

Notes:
NE = Not established

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Sample ID	Location ID	Sample Date	Depth	Barium	Beryllium	Cadmium	Chromium Total	Silver	Arsenic	Lead	Selenium
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
B23-HA1-1-000	HA01	3/20/91	0.5	72	<0.56	<0.56	6.7	<1.1	NA	NA	NA
B23-HA1-1-005	HA01	3/20/91	5	59	<0.52	<0.52	3.5	<1	3.1	3.9	<0.52
B23-HA1-2-005	HA02	3/20/91	5	57	<0.52	<0.52	3.5	<1	2.9	3	<0.52
B23-HA1-2-000	HA02	4/27/94	0.5	86	<0.51	<0.51	5.1	<1	4.3	5.8	<0.51
B23-CPS1-1-010	CPS01	5/18/94	10	130	<0.53	<0.53	6.7	<1.1	2.3	13	<0.53
Analyses				5	5	5	5	5	4	4	4
Detections				5	0	0	5	0	4	4	0
Minimum Concentration				57	0	0	3.5	0	2.3	3	0
Maximum Concentration				130	0	0	6.7	0	4.3	13	0
HWAD - PCG				2000	1	20	20	100	100	100	20
HWAD - PCG Hits				0	0	0	0	0	0	0	0

Notes:
NA = Not analyzed
Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Arsenic
Method 7060 (ASC)

Sample ID	Location ID	Sample Date	Depth	Arsenic
				mg/kg
B23-HA1-1-000	HA01	3/20/91	0.5	2.9
B23-HA1-1-005	HA01	3/20/91	5	3.1
B23-HA1-2-005	HA02	3/20/91	5	2.9
B23-HA1-2-000	HA02	4/27/94	0.5	4.3
B23-CPS1-1-010	CPS01	5/18/94	10	2.3

Analyses	5
Detections	5
Minimum Concentration	2.3
Maximum Concentration	4.3
HWAD - PCG	100
HWAD - PCG Hits	0

Lead
Method 7421 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lead
				mg/kg
B23-HA1-1-000	HA01	3/20/91	0.5	24
B23-HA1-1-005	HA01	3/20/91	5	3.9
B23-HA1-2-005	HA02	3/20/91	5	3
B23-HA1-2-000	HA02	4/27/94	0.5	5.8

Analyses	4
Detections	4
Minimum Concentration	3
Maximum Concentration	24
HWAD - PCG	100
HWAD - PCG Hits	0

Mercury
Method 7471 (ASC)

Sample ID	Location ID	Sample Date	Depth	Mercury
				mg/kg
B23-HA1-1-000	HA01	3/20/91	0.5	0.18
B23-HA1-1-005	HA01	3/20/91	5	<0.1
B23-HA1-2-005	HA02	3/20/91	5	<0.1
B23-HA1-2-000	HA02	4/27/94	0.5	<0.1
B23-CPS1-1-010	CPS01	5/18/94	10	<0.11

Analyses	5
Detections	1
Minimum Concentration	0.18
Maximum Concentration	0.18
HWAD - PCG	24
HWAD - PCG Hits	0

Selenium
Method 7740 (ASC)

Sample ID	Location ID	Sample Date	Depth	Selenium
				mg/kg
B23-HA1-1-000	HA01	3/20/91	0.5	<0.56
B23-HA1-1-005	HA01	3/20/91	5	<0.52
B23-HA1-2-005	HA02	3/20/91	5	<0.52
B23-HA1-2-000	HA02	4/27/94	0.5	<0.51
B23-CPS1-1-010	CPS01	5/18/94	10	<0.53

Analyses	5
Detections	0
Minimum Concentration	0
Maximum Concentration	0
HWAD - PCG	20
HWAD - PCG Hits	0

Note:
Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Explosives
Method 8330 (ASC)

Sample ID	Location ID	Sample Date	Depth	2,4,6-TNT	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Amino-4,6-DNT	2-Nitrotoluene	3-Nitrotoluene	4-Amino-2,6-DNT	4-Nitrotoluene	HMX	m-Dinitrobenzene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
B23-HA1-1-000	HA01	3/20/91	0.5	150000	12	<1	<1	<1	<1	<1	<1	4000	<1
B23-HA1-1-005	HA01	3/20/91	5	780	<1	<1	<1	<1	<1	<1	<1	69	<1
B23-HA1-2-005	HA02	3/20/91	5	1.1	<1	<1	<1	<1	<1	<1	<1	0.93 J	<1
B23-HA1-2-000	HA02	4/27/94	0.5	0.54 J	<1	<1	<1	<1	<1	<1	<1	16	<1
B23-CPS1-1-010	CPS01	5/18/94	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Analyses				5	5	5	5	5	5	5	5	5	5
Detections				4	1	0	0	0	0	0	0	4	0
Minimum Concentration				0.54	12	0	0	0	0	0	0	0.93	0
Maximum Concentration				150000	12	0	0	0	0	0	0	4000	0
HWAD - PCG				233	2.6	80	NE	800	800	NE	800	4000	8
HWAD - PCG Hits				2	1	0	NE	0	0	NE	0	1	0

Notes:
NE = Not established
Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Explosives
Method 8330 (ASC)

Sample ID	Location ID	Sample Date	Depth	Nitrobenzene	RDX	sym-Trinitrobenzene	Tetryl
				mg/kg	mg/kg	mg/kg	mg/kg
B23-HA1-1-000	HA01	3/20/91	0.5	<1	33000	13	<1
B23-HA1-1-005	HA01	3/20/91	5	<1	280	7.3	<1
B23-HA1-2-005	HA02	3/20/91	5	<1	4.3	1.4	<1
B23-HA1-2-000	HA02	4/27/94	0.5	<1	28	<1	<1
B23-CPS1-1-010	CPS01	5/18/94	10	<1	<1	<1	<1
Analyses				5	5	5	5
Detections				0	4	3	0
Minimum Concentration				0	4.3	1.4	0
Maximum Concentration				0	33000	13	0
HWAD - PCG				40	64	4	800
HWAD - PCG Hits				0	2	2	0

Notes:
NE = Not established
Zero values listed for maximum and minimum concentrations indic

Picric Acid
Method 8330M (ASC)

Sample ID	Location ID	Sample Date	Depth	Picric Acid
				mg/kg
B23-HA1-1-000	HA01	3/20/91	0.5	1.5
B23-HA1-1-005	HA01	3/20/91	5	<0.25
B23-HA1-2-005	HA02	3/20/91	5	<0.25
B23-HA1-2-000	HA02	4/27/94	0.5	<0.25
B23-CPS1-1-010	CPS01	5/18/94	10	<0.25

Analyses	5
Detections	1
Minimum Concentration	1.5
Maximum Concentration	1.5
HWAD - PCG	7
HWAD - PCG Hits	0

Notes:
NE = Not established.
HWAD Action Level based on guidance from ASTDR and NDEP approval.

Nitrate/Nitrite
Method 9200 (ASC)

Sample ID	Location ID	Sample Date	Depth	Nitrate-Nitrogen
				mg/kg
B23-HA1-1-000	HA01	3/20/91	0.5	32
B23-HA1-1-005	HA01	3/20/91	5	1.9
B23-HA1-2-005	HA02	3/20/91	5	<1
B23-HA1-2-000	HA02	4/27/94	0.5	5.4

Analyses	4
Detections	3
Minimum Concentration	1.9
Maximum Concentration	32
HWAD - PCG	128000
HWAD - PCG Hits	0

Appendix D

WINDROW CONFIRMATION SAMPLES

SWMU B-23

Tetra Tech
Hawthorne Army Depot

ONSITE ENVIRONMENTAL LABORATORIES

Date Received: 6/6/00
Cooler ID: 0012
COC #: 002

Report No : 000606
SDG No : 000606exp
Reported by : Chris Cao

Matrix : soil
Units : mg/Kg

Field Sample ID No.		PAD01-WR01A-060100		PAD01-WR01B-060100		PAD01-WR01C-060100		PAD01-WR01D-060100		PAD01-WR02A-060100		PAD01-WR02B-060100	
Lab Sample ID No.		NAV016		NAV017		NAV018		NAV019		NAV020		NAV021	
Sample Depth		0		0		0		0		0		0	
Date Sampled		6/1/00		6/1/00		6/1/00		6/1/00		6/1/00		6/1/00	
Time Sampled		12:40		12:44		12:48		12:52		13:15		13:28	
Date Extracted		6/6/00		6/6/00		6/6/00		6/6/00		6/6/00		6/6/00	
Time Extracted		16:40		16:40		16:40		16:40		16:40		16:40	
Date Analyzed		6/6/00		6/6/00		6/6/00		6/6/00		6/6/00		6/7/00	
Time Analyzed		22:39		22:58		23:17		23:36		23:55		0:15	
Analytes	PQL	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.	Conc.	Qual.
HMX	4.4	18		12		16		35		140		290	E
RDX	2.0	3.5		2.4	J	4.5		15		10		22	
1,3,5-TNB	2.0	3.1	U	2.8	U	3	U	2.8	U	3.2	U	3.2	U
1,3-DNB	0.8	1.2	U	1.1	U	1.2	U	1.1	U	1.3	U	1.3	U
NB	1.6	2.5	U	2.2	U	2.4	U	2.3	U	2.5	U	2.6	U
Tetryl	8.4	13	U	12	U	13	U	12	U	13	U	14	U
Amino-DNTs	2.4	3.7	U	3.4	U	3.6	U	1.6	J	1.1	J	1.6	J
2,4,6-TNT	3.6	2	J	5.1	U	5.4	U	2.2	J	0.51	J	2.1	J
2,6-DNT	2.0	3.1	U	2.8	U	3	U	2.8	U	3.2	U	3.2	U
2,4-DNT	1.6	2.5	U	2.2	U	2.4	U	2.3	U	2.5	U	2.6	U
2-NT	4.4	6.8	U	6.2	U	1.7	J	3.3	N	7	U	7.1	U
4-NT	14.0	22	U	20	U	21	U	20	U	22	U	23	U
3-NT	6.8	11	U	9.6	U	10	U	9.6	U	11	U	11	U
Surrogate	QC Limits												
1,2-DNB	65%-135	0%		85%		77%		55%		53%		80%	
Dilution Factor		1		1		1		1		1		1	
Percent Solids		68%		75%		71%		74%		67%		64%	

Notes :
U - Not detected at reported value
J- Between MDL and PQL
D - Dilution was performed on sample
E - Estimated value, result outside calibration range
DL - Surrogate diluted out due to high concentration of target compounds
PQL - Practical Quantitation Limit
N- non-confirmed by all three wavelengths
mg/Kg - Milligrams per kilogram (PPM)

Onsite Environmental Laboratories, Inc.
Tel: (510) 490-8571 Fax: (510) 490-8572

SWMU CONFIRMATION SAMPLES

SWMU B-23

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result ~~A2-WR008D-G005-GG001-P~~ 99-05898-9	Analysis Result SMB23-GP001-P 99-05898-11
NITROAROMATICS AND NITROAMINES					
Dilution Factor				10	10
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	6.1	<2.1
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	2J	<2.1
1,3-DINITROBENZENE	8330	mg/kg	0.25	<3.4	<2.6
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<3.4	<2.6
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<3.4	<2.6
HMX	8330	mg/kg	0.25	42	86
NITROBENZENE	8330	mg/kg	0.25	<3.4	<2.6
3-NITROTOLUENE	8330	mg/kg	0.25	<3.4	<2.6
RDX	8330	mg/kg	0.25	246	52
TETRYL	8330	mg/kg	0.25	<3.4	<2.6
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	4.6	3J
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	3J	105
2-NITROTOLUENE [a]	8330	mg/kg	0.25	<3.4	<2.6
4-NITROTOLUENE [a]	8330	mg/kg	0.25	<3.4	<2.6

Component Analyzed	Method	Unit	PQL	Analysis Result SMB23-GS001-P 99-05898-12	Analysis Result SMB23-GS002-P 99-05898-13
MOISTURE	ASTM-D2216	%Moisture	0.5	1.8	1.8
NITROAROMATICS AND NITROAMINES					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	<0.20
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	0.1J
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.25	<0.25
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.25
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.25
HMX	8330	mg/kg	0.25	9.18	1.5
NITROBENZENE	8330	mg/kg	0.25	<0.25	<0.25
3-NITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.25
RDX	8330	mg/kg	0.25	1.5	6.90
TETRYL	8330	mg/kg	0.25	<0.25	<0.25
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.25	0.2J
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	0.26	0.43
2-NITROTOLUENE [a]	8330	mg/kg	0.25	<0.25	<0.25
4-NITROTOLUENE [a]	8330	mg/kg	0.25	<0.25	<0.25

Component Analyzed	Method	Unit	PQL	Analysis Result SMB23-GS003-P 99-05898-14	Analysis Result SMB23-GS004-P 99-05898-15
MOISTURE	ASTM-D2216	%Moisture	0.5	0.9	1.6

Applied P & Ch Laboratory
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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result SMB23-GS003-P 99-05898-14	Analysis Result SMB23-GS004-P 99-05898-15
NITROAROMATICS AND NITROAMINES					
Dilution Factor				1	10
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	<2.0
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	<2.0
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.25	<2.5
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.25	<2.5
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.25	<2.5
HMX	8330	mg/kg	0.25	0.98	12
NITROBENZENE	8330	mg/kg	0.25	<0.25	<2.5
3-NITROTOLUENE	8330	mg/kg	0.25	<0.25	<2.5
RDX	8330	mg/kg	0.25	5.10	62
TETRYL	8330	mg/kg	0.25	<0.25	<2.5
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	0.1J	<2.5
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	8.53	12
2-NITROTOLUENE [a]	8330	mg/kg	0.25	<0.25	<2.5
4-NITROTOLUENE [a]	8330	mg/kg	0.25	<0.25	<2.5

Component Analyzed	Method	Unit	PQL	Analysis Result SMB23-GS005-P 99-05898-16
MOISTURE	ASTM-D2216	%Moisture	0.5	1.8
NITROAROMATICS AND NITROAMINES				
Dilution Factor				1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	0.2J
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.25
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.25
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.25
HMX	8330	mg/kg	0.25	1.6
NITROBENZENE	8330	mg/kg	0.25	<0.25
3-NITROTOLUENE	8330	mg/kg	0.25	<0.25
RDX	8330	mg/kg	0.25	7.92
TETRYL	8330	mg/kg	0.25	<0.25
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	0.2J
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	0.74
2-NITROTOLUENE [a]	8330	mg/kg	0.25	<0.25
4-NITROTOLUENE [a]	8330	mg/kg	0.25	<0.25

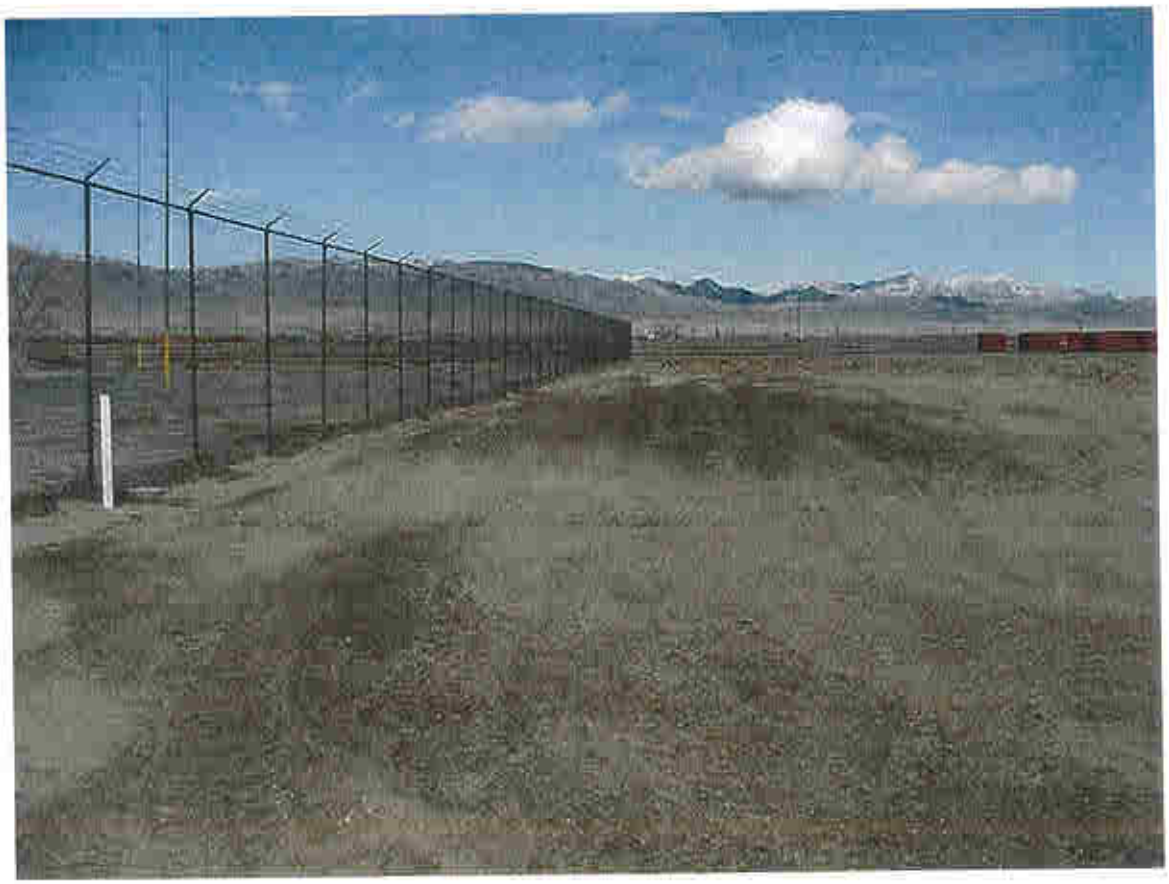
Component Analyzed	Method	Unit	PQL	Analysis Result AS-WR002D-C001-CC001-P 99-05898-1	Analysis Result AS-WR002D-C002-CC001-P 99-05898-2
Dilution Factor				1	1
PICRIC ACID	M8330	mg/kg	2.5	<3.7	<3.2

Appendix E

SWMU B-22: Facing southwest. Dredge pile on southwestern end of impoundment. R5N11. 9/29/94.

SWMU B-23: Facing northwest toward impoundment. Buildings 103-29 and 103-30 in the background. R5N14. 9/29/94.

September 1994



February 2000